

Partial history of EPA collaborative involvement in study of airborne manganese (Mn) in Ohio

- 1999** EPA issues final rule (National Emission Standards for Hazardous Air Pollutants for Ferroalloys Production: Ferromanganese and Silicomanganese). Eramet-Marietta (Marietta, OH) is the only US source in the source category.
- R5 ARD responds to citizen complaints/inquiries on Marietta OH air pollution
- EPA-ORD neurotoxicologist contacts EPA R5 staff regarding potential collaboration on health study of airborne Mn in Ohio
- OH EPA deploys air monitors at three East Liverpool OH sites. EPA also conducts air monitoring near the Waste Technologies Industries (WTI) incinerator, detecting airborne Mn consistent with S.H. Bell emissions.
- 2000** US Senator Mike DeWine (OH) petitions the Agency for Toxic Substances and Disease Registry (ATSDR) to determine if air pollution is affecting the health of Marietta, OH residents
- EPA conducts air monitoring in the vicinity of the WTI waste incinerator, East Liverpool OH
- 2002-2004** ATSDR community meetings discuss additional air monitoring data in Marietta OH. ATSDR and OH EPA fund, site and deploy additional air monitors.
- 2003** EPA R5 Air enforcement staff conduct inspection of Eramet-Marietta, believed to be substantially contributing to airborne Mn measured at a local monitor
- 2004-2005** EPA R5 ARD staff and ORD neurotoxicologist submit Regional Applied Research Effort (RARE) project proposal for health study of airborne Mn in Marietta OH children. The proposal is selected for funding but delayed by administrative, collaborative, design and personnel issues.
- Marietta OH citizens ask ATSDR for a community health study. ATSDR contacts EPA regarding pooling funds and collaborating on combined EPA-ATSDR study.
- Ongoing R5 EPA involvement with Marietta OH citizen concerns regarding airborne Mn
- 2005** EPA Region 5 sends residual risk test (“risk test memo”) results to OAQPS. The purpose of the risk test memo is to determine whether the Ferroalloys Production source category can be eliminated from further study under Clean Air Act section 112(f), based on simple analysis of available information. Risk test memo results do not support elimination; further analysis is recommended.
- 2007** ATSDR releases Washington County Air Quality Health Consultation that finds inadequate exposure data, cites need for additional air monitoring and health study if later warranted. Deploys three additional air monitors in Marietta OH vicinity.
- 2008** Ohio EPA completes East Liverpool Air Quality study that identifies health risk from Mn (34-fold > reference value) and chromium
- 2008** Ohio EPA Director issues Findings & Orders to S.H. Bell to reduce air pollutant emissions and petitions ATSDR to evaluate potential health effects of airborne metals in East Liverpool OH.

- 2008 (ctd.)** Delayed and modified R5 RARE proposal for health study of airborne Mn in Marietta adults is recommended to R5 management for 2009 funding
- Standridge et al. (Erin Haynes group, U of Cincinnati) publish pilot study of balance in Marietta adults. They conclude "...Preliminary findings suggest subclinical impairment in postural balance among residents chronically exposed to ambient Mn" and recommend a larger study.
- 2009** ATSDR Marietta OH Health Consultation released, concluding that Mn is the only identified metal exceeding both background concentrations and health based guidelines.
- EPA-funded adult Mn health study ("RARE Pt. 1") initiated in Marietta and Mt. Vernon OH, which ATSDR supports.
- EPA releases list of schools for air monitoring as part of initiative to understand whether outdoor toxic air pollution poses health concerns to school children (School Air Toxics study). Two Marietta schools and one East Liverpool school are listed.
- 2010** Preliminary RARE Pt. 1 results released at a public meeting in Marietta OH, reporting few Marietta-Mt. Vernon differences; e.g. those living closer to the source scored worse on some neuropsychological tests but most results are within normal ranges
- ATSDR issues Health Consultation for East Liverpool Air Quality Investigation. It concludes that Mn is the only chemical exceeding both background levels and health-based guidelines and poses a public health hazard (Water Plant Monitor 10 year TSP Mn average concentration = 1.3 ug/m³, HQ=26)
- 2011** R5 "RARE Pt. 2" health study of Mn exposure in East Liverpool OH adults is selected for funding. East Liverpool field work (e.g. blood samples, neurologic exam, test batteries) conducted in November 2011.
- Kim et al. paper published in Neurotoxicology (motor function, Marietta-Mt. Vernon; RARE Pt. 1 results) reports subclinical effects on movement and balance tests. Cautiously interprets subtle effects.
- 2012** Bowler et al. paper published in International Journal of Hygiene and Environmental Health (anxiety and motor effects, Marietta-Mt. Vernon; RARE Pt. 1 results). Town differences in anxiety are reported, but authors state that whether airborne Mn or heightened concern about air pollution is responsible "remains an open question".
- In September, Erin Haynes (University of Cincinnati) conducted public meeting in East Liverpool providing preliminary results from biomarker study on children. She collected this data same day EPA was in East Liverpool collecting data.
- 2013** EPA contract finalized with San Francisco State University to continue Ohio Mn health study work. First contract deliverable is 4/18/13 East Liverpool public meeting to present preliminary health study results to the community. This meeting has been postponed due to medical emergency of contractor.
- Final EPA rule for Ferroalloys Production (affecting Eramet-Marietta) scheduled for promulgation